

## **REMARKS**

Reconsideration of the present application, in view of the arguments presented herein, is respectfully requested.

### **I. STATUS OF THE CLAIMS**

Claims 1-37 are pending in the present application.

### **II. Rejections Under 35 U.S.C. § 103(a):**

**(i) Claims 1, 3-5, 11-16, 22-33 and 35-37 have been rejected as being unpatentable over U.S. Patent No. 6,054,248 to Foster et al. (“the Foster patent”) in view of U.S. Patent No. 4,276,136 to Gruber et al. (“the Gruber patent”), U.S. Patent No. 6,261,687 to Ryang et al. (“the Ryang patent”) or U.S. Patent Application Publication No. 2004/0009428 to Tamura et al. (“the Tamura patent”) in view of U.S. Patent No. 6,146,793 to Schaedeli et al. (“the Schaedeli patent”).**

**(ii) Claims 10 and 21 have been rejected as being unpatentable over Foster in view of Ryang, Gruber or Tamura in view of U.S. Patent No. 6,319,655 to Wong et al. (“the Wong patent”).**

In response, it is submitted the above rejections have been traversed for the reasons set forth below.

The combination of Foster, Gruber, Ryang, Tamura and Schaedeli fails to render claims 1, 13, 24, 29 or 35 obvious. First of all, pursuant to U.S. patent law, in order to modify a reference or combine references with one another, there must be some teaching in the art regarding the desirability of doing so. (See MPEP 2143.01) In addition, to establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. (See MPEP 2143.03; *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)).

However, the cited references of Foster, Gruber, Ryang, Tamura and Schaedeli fail to provide such a desirability or teaching for making the above proposed combination set forth in the instant Office Action. Nevertheless, even if combined, this combination of Foster, Gruber, Ryang, Tamura and Schaedeli still fails to teach or suggest all of the features recited in claim 1, 13, 24, 29 or 35.

A. Cited References Fail to Render Claims 1 and 24 Obvious

In particular, the combination of Foster, Gruber, Ryang, Tamura and Schaedeli fails to teach or suggest a method which includes forming an underlayer of a bilayer resist system by irradiating a blended material with an e-beam, and wherein the blended material includes a novaloc polymer or a naphthalene polymer blended with a methacrylate polymer, represented by the chemical formula as essentially recited in claims 1 and 24.

Rather, as conceded by the Examiner in the instant Office action, Foster fails to teach or suggest either using e-beam curing to form an underlayer of a bilayer resist or using novolac resins for forming an underlayer. (**See page 8, line 22 and page 9, lines 10-11 of the instant Office Action**). However, not only does Foster fail to teach or suggest the use of Novolac resins, Foster actually expressly teaches away from their use. For example, Foster discusses what it perceives to be disadvantages associated with using novalac resins. (**See Col. 1, lines 46-55 of Foster**). Instead, Foster seeks to provide an undercoat which has an etch rate comparable to novolac resins, but which do not include novalac resins. In contrast, Foster provides a voluminous laundry list of other possible compounds (excluding novolac resins) which may be used in forming its undercoat layer. (**See Col. 2, lines 63-67 and Cols. 3-5 of Foster**). In other words, it is clearly an objective of Foster to avoid the use of novaloc resins in forming its underlayer.

The teachings of Foster thus clearly discourage and teach away from using novolac resins in forming underlayers of bilayer resist systems. Accordingly, one skilled in the art would not modify the primary reference of Foster as proposed in the instant Office Action to include novalac resins due to the fact that Foster as discussed above expressly teaches away from doing so. Consequently, even if Foster, Gruber, Ryang, Tamura and Schaedeli were combined, this

proposed combination would still at the very least fail to teach or suggest the feature of e-beaming a blended material which includes a novaloc polymer blended with a methacrylate polymer, represented by the chemical formula of claims 1 and 24 to form an underlayer of a bilayer resist, as essentially recited in claims 1 and 24.

Furthermore, Foster, Gruber, Ryang, Tamura and Schaedeli also at the very lease fail to teach or suggest the feature of e-beaming a blended material which includes a naphthalene polymer blended with a methacrylate polymer, represented by the chemical formula of claims 1 and 24 to form an underlayer of a bilayer resist, as essentially recited in claims 1 and 24. In contrast, Foster, Gruber, Ryang, Tamura and Schaedeli are each completely silent regarding the feature of e-beaming a blended material which includes a naphthalene polymer blended with a methacrylate polymer, represented by the specific chemical formula as essentially recited in claims 1 and 24.

Moreover, it would not have been obvious to one skilled in the art to provide the feature of e-beaming a blended material which includes a naphthalene polymer blended with a methacrylate polymer, of the specific chemical formula as essentially recited in claims 1 and 24 for at least the reasons set forth below. In particular, the teachings of Foster, Gruber, Ryang, Tamura and Schaedeli each fail to provide sufficient motivation for doing so. As mentioned above, pursuant to U.S. patent law, in order to modify a reference , there must be some teaching in the art regarding the desirability of doing so. (See MPEP 2143.01) However, the Foster, Gruber, Ryang, Tamura and Schaedeli references each fail to provide such a desirability or teaching. Rather, Foster, Gruber, Ryang, Tamura and Schaedeli each simply provide a voluminous laundry list of possible compounds to choose from in forming their respective coatings, without any hint or suggestion as to the desirability of choosing a blended material which includes a naphthalene polymer blended with a methacrylate polymer, of the specific chemical formula as essentially recited in claims 1 and 24. Furthermore, it is also a well established fact in the field of U.S. patent law that the chemical art is an unpredictable art. ( See **In re Marzocchi, 439 F.2d 220, 223-24, 169 USPQ 367, 368-70 (CCPA 1971) and 2164.03 of the MPEP**) Therefore, due to the unpredictability of chemical compounds and chemical reactions, it would not have been obvious to one skilled in the art to provide e-beaming a blended material which includes a naphthalene polymer blended with a methacrylate polymer, of

the specific chemical formula to form an underlayer of a bilayer resist as essentially recited in claims 1 and 24 with a reasonable expectation of success.

Therefore, for the reasons discussed above, the combination of Foster, Gruber, Ryang, Tamura and Schaedeli fails to teach or suggest a method which includes forming an underlayer of a bilayer resist system by irradiating a blend material with an e-beam, and wherein the blend material includes a novaloc polymer or a naphthalene polymer blended with a methacrylate polymer, represented by the chemical formula as essentially recited in claims 1 and 24. Withdrawal of the rejections to independent claims 1 and 24 is thus respectfully requested. As claims 5, 11, 12, 36 and 37 depend from and incorporate all of the limitations of claim 1 and claims 25-28 depend from and incorporate all of the limitations of claim 24, applicants respectfully submit that the rejection to these dependent claims likewise be withdrawn.

**B. The Proposed Combination of Foster, Gruber, Ryang, Tamura and Schaedeli is Defective**

Moreover, besides the reasons discussed above, it is further noted that the combination of Foster, Gruber, Ryang, Tamura and Schaedeli is also defective because the Examiner has failed to provide sufficient motivation for making the above combination. As is well known under the U.S. Patent Laws, the Examiner bears the initial burden of establishing a *prima facie* conclusion of obviousness. (See MPEP 2142). In particular, the Examiner has failed to meet the above burden because the motivation asserted by Examiner in the instant Office Action that it would have been obvious to employ an e-beam to cure the thermally curable underlayer of Foster because Gruber, Ryang, Tamura each teach it is conventionally known to do so is clearly erroneous. The above statement is erroneous, because although these references discuss photosensitive compositions none of the compositions or methods described in Gruber, Ryang, Tamura even relate to e-beaming a coating to form an underlayer of a bilayer resist. In other words, the e-beams described Gruber, Ryang, Tamura are not used to form an underlayer of a bilayer resist. Furthermore, the Foster reference has very specific process conditions (e.g. temperature and time conditions) that it requires for forming its under layer and the Examiner sets forth insufficient motivation or desire as to why to one skilled in the art would alter these

required process conditions set forth in Foster to include an e-beam curing method. (See Col. 2, lines 49-63 of Foster).

Thus, the motivation provided by the Examiner in the instant Office Action is nothing more than conclusory and is therefore insufficient for establishing the requisite motivation for making the combination proposed set forth in the instant Office Action. Accordingly, for at least this reason the above rejections to claims 1 and 24 and the claims dependent thereon should be withdrawn.

**C. Cited References Fail to Render Claims 13, 29 and 35 Obvious**

Claims 13, 29 and 35 each essentially recite a method which includes using an e-beam to form an underlayer of a bilayer resist. As conceded by the Examiner in the instant Office Action, Foster fails to teach or suggest using an e-beam to form an underlayer of a bilayer resist. Additionally, as discussed above with regard to claims 1 and 24, the Examiner has failed to provide sufficient motivation on the record for making the proposed combination set forth in the instant Office Action to provide the coating of Foster with an e-beam for forming its underlayer. Accordingly, for at least the reasons set forth above, the rejection to claims 13, 29, 35 and the claims dependent thereon (claims 14-16, 22, 23, and 30-33) should likewise be withdrawn.

**D. Cited References Fail to Render Claims 10 and 21 Obvious**

Lastly, it is asserted that claims 10 and 21 are patentable over the proposed combination of Foster, Gruber, Ryang, Tamura, Schaedeli and Wong. Claims 10 and 21 depend from claims 1 and 13, respectively. As discussed above, Foster, Gruber, Ryang, Tamura, Schaedeli fail to teach or suggest a method which includes forming an underlayer of a bilayer resist system by irradiating a blend material with an e-beam, and wherein the blend material includes a novaloc polymer or a naphthalene polymer blended with a methacrylate polymer, represented by the chemical formula as essentially recited in claim 1. The Wong reference fails to cure the above deficiencies of Foster, Gruber, Ryang, Tamura, Schaedeli because Wong at the very least also fails to teach or suggest a method which includes forming an underlayer of a bilayer resist system by irradiating a blended material with an e-beam, and wherein the blended material

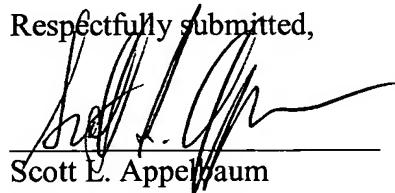
includes a novaloc polymer or a naphthalene polymer blended with a methacrylate polymer, represented by the chemical formula as essentially recited in claim 1. Thus claim 10 is likewise patentable over the over the proposed combination of Foster, Gruber, Ryang, Tamura, Schaedeli and Wong and therefore the rejection to claim 10 should be removed.

Moreover, the rejection to claim 10 should also be removed because at the very least, as discussed above with regard to claim 1, the Examiner has failed to meet the initial burden of establishing a prima facie conclusion of obviousness by failing to provide sufficient motivation on the record for combining Foster, Gruber, Ryang, Tamura, Schaedeli as proposed in the instant Office Action. Consequently, the combination of Foster, Gruber, Ryang, Tamura, Schaedeli and Wong is likewise defective. Furthermore, the rejection to claim 21 should likewise be removed because as discussed above, there is insufficient motivation provided on the record for combining Foster, Gruber, Ryang, Tamura, Schaedeli and Wong as proposed in the instant Office Action.

### III. Conclusion:

For the foregoing reasons, the present application is believed to be in condition for allowance. The Examiner's early and favorable action is respectfully requested. The Examiner is invited to contact the undersigned if he has any questions or comments in this matter.

Respectfully submitted,



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Scott E. Appelbaum  
Reg. No. 41,587  
Attorney for Applicants

F. Chau & Associates, LLC  
130 Woodbury Road  
Woodbury, NY 11797  
Tel: (516) 692-8888  
Fax: (516) 692-8889